Design at a distance

Conference or Workshop Item

INTERNATIONAL CONFERENCE ON ENGINEERING AND PRODUCT DESIGN EDUCATION
10 & 11 SEPTEMBER 2009, UNIVERSITY OF BRIGHTON, UK

DESIGN AT A DISTANCE

Georgina Holden
The Open University

ABSTRACT
The Open University has been teaching design at a distance for three decades. In this time delivery mechanisms have changed from non-interactive broadcasts to interactive media. A new generation of courses is emerging taught entirely online. This offers many challenges and opportunities
This paper describes three tools that will be used in a new, level 1 course. Knowledge mapping, animated screen capture and an online studio space, OpenDesignStudio, which is a development of the Flickr photo-sharing interface. The advantage of the almost ubiquitous use of Web2 technologies is that students are communicating more and the potential for these technologies to support collaborative work in a learning environment is growing. The paper also discusses how assessment strategies might be re-considered to recognise and credit students who are increasingly using web resources to aid and augment their learning. The use of knowledge maps offers a way for students to bring together the materials they find for assessment tasks in one place and to relate and link those materials together. The use of animated screen capture offers the opportunity to present ideas and reflect upon process at a distance and hone communication and presentation skills. The online studio allows for peer support and review in text and audio-visually and also provides an arena in which the tutor can check on progress and offer individual advice at a distance.

Introduction

For more than 30 years The Open University has faced the challenge of teaching a diverse group of learners design, at a distance. This has been achieved through specially created course materials that present the requisite knowledge and skills in a mainly textual form. These materials are written by full time academics, who, until the advent of email, had little formal opportunity for contact with students other than occasional residential schools. The face-to-face contact that exists is between student and part-time tutor and this tutor is also the marker for assessment. Face to face contact is in general limited to half a dozen occasions per year. Central academics are thus tasked to create materials that stand alone, and can be studied by isolated learners with limited access to equipment and resources in their home learning environment. Despite these constraints the OU has succeeded in teaching many thousands of students fundamental design principles, knowledge and skills thorough a combination of theoretical and practical work. There are currently approximately 1000 students a year taking the design courses and this number is estimated to double next year when a new on-line course is introduced. The design courses contribute to a number of awards within the University, including the BSc Technology, the BA Business Studies, BSc in Computing and Design and a number of diplomas.

There has, in thirty four years, been significant evolution of both the content and the delivery mechanisms for courses. My own involvement with the OU design group spans most of that 30 years and in that time I have held a number of roles from undergraduate and postgraduate student through to tutor, course manager, regional staff tutor and central academic. This experience has given me a deep understanding of the perspectives of most of the significant actors engaged with this distance, design education. The insights that are presented in this paper are grounded in my experience as a reflective practitioner, working to meet the changing needs of all those involved.

Design at the Open University

The first words of the first Open University Design course, Man-Made Futures (T262), launched in 1975 were a quote from Victor Papanek, "The main trouble with design schools seems to be that they teach too much design and not enough about the social, economic and political environment in which design takes place." [1]

This quote is followed by a discussion headed "What is designing" in which the authors, Nigel Cross, Dave Elliott and Robin Roy, set out several different definitions of the word design before making the assertion, "...the designer in any of these situations will not necessarily be an engineer or architect, or any of the generally recognised design professionals. He or she might be a manager, politician, protestor, consumer, lawyer, trades unionist, pressure group, butcher, baker or candlestick maker. Sometimes, almost certainly, the designer will be you." In a paper to the 1976 Design Research Society Conference Nigel Cross, arguing for a user centred approach to designing, described the intentions of the course as, ".. concerned with the interface between technology and society and the role of design in modifying that interface. The role of design is presented as important because it is concerned with what **might be,** and it is only then that we can break out of what **is**". [2]

These quotes, from Papanek and Cross et al, summarise succinctly, the ethos which has informed design teaching at the Open University since its inception, the provision of a general design education which examines the act of designing in its context and requires students to develop an understanding of the design process and an awareness of the impacts of the design decisions that they make.

There are several important themes that have permeated OU design teaching.

1. The need for user-centred design, an idea which has greater currency than ever as "delight" becomes a sought after factor in product design. Holistic approaches to evaluation including the observation of users and an understanding their values are a strong strand of OU design teaching
2. The need for sustainable design, an idea, which is even more relevant now, than it was when first discussed in the very first course.
3. The need to facilitate creative thinking by offering palettes of techniques and methods that the student can try out.

These themes sit alongside the teaching of drawing and modelling skills and lead the student to develop a deep and reflective understanding of design processes, principles and issues.

The question "What is Design" remains core to the OU courses, as do contentions that the activity of designing is essentially solution-focused, but that the best tentative solutions come from an understanding the problem. The courses teach these, and other design themes, through a range of case studies that exemplify design principles and processes. The OU approach to design is as a discipline using a constructivist approach to engender a designerly way of knowing and thinking. [3]
As the courses have evolved they have included more on designing for markets; more teaching on topologies and configurations and more about product development and design for manufacture. Importantly courses have placed increasing emphasis on skills development, refining and developing the instruction and examples used for learning drawing and modelling.

The current version of the second level course, "Design and Designing" was launched first in 2004 and has around 500 students per year. There is a strong emphasis on the need for a user centred approach to design and video case-studies show this approach in use in IDEO and Philips Design Research. The theme of design for the environment is discussed early on in the course to encourage students to consider this from the beginning of the design process and case studies in the course are more diverse than in previous versions, ranging from computer games design through to roller coasters, with many different scales of design in between. These case studies enable a discussion of the changing contexts of designing such as globalisation, evolving technologies and economic and environmental challenges.

On the third level design course,"Innovation: Designing for a sustainable future" these themes are picked up and explored in greater depth, the case studies on this course include renewable energy technologies. There is also strong encouragement for students to take sustainability as a driver for the major piece of project work that defines the course. Like the second level course text and video case studies are used to show real-world examples of user centred design, sustainable design and the context of innovation.

Currently, academics are working on a new, level one, introductory course entitled "Design Thinking" which will be launched in February 2010. This new course will be delivered and studied entirely online and, as such, has demanded a completely new pedagogic approach.

Delivery Mechanisms Shape Content

"The medium is the message" Marshall McLuhan [4]

Whilst the curriculum of OU Design courses have evolved and changed the delivery mechanisms for that content changed in small increments until the 2000s. The main source of teaching and learning was printed text supplemented by visual and audio communications aimed at bringing a different perspective to the student. The earliest forms of these communications were broadcasts, which were limited by the timeslots allocated by the BBC (25 minutes for television, 15 for radio). In the 1980's, the widespread diffusion of video and audio tape recorders allowed for these materials to be distributed on tape offering the student greater flexibility about when they studied, however, for most of this period the old broadcast rules governed both the length and the form of the use of this media, particularly video. Content continued to be carefully constructed and scripted narrative on design topics, initially delivered by academics themselves but later professionally voiced. These media continued in use on the design courses until 2004 when the current second level course was launched.

The writing of "Design and Designing" in the early 2000s presented the opportunity to utilise rapidly diffusing DVD ROM technology to both deliver video materials and also bring together a suite of electronic tools to create studio facilities on the student's own desktop. The resulting DVD offers a rich environment which includes; externally sourced software, ThoughtPath for creative thinking SolidThinking for solid modelling, ECO-IT for life-cycle; in house interactive exercises to teach creative thinking techniques and understand aspects of configuration; a small database of 3D images; clones of selected external case study websites. The DVD also includes a specially developed video interface which allows the student not only to watch narrative videos but also to select more in-depth comments from the designers and others interviewed. This enables the student to benefit from more of the video footage and allows self-directed exploration of the resource.

In contrast, the new "Design Thinking" course will be entirely virtual, apart from a welcome pack. Although the design group is experienced in the creation of successful online short courses in design related topics, this will be the first 60 CATS point course to be delivered entirely through this medium. The challenge faced by the course team is to find overarching cohesion for each block of study and create a coherent learning experience with a transparency of structure and content that concurs with the intentions of the academic authors. The course team has a well developed rationale for the juxtaposition of elements and the progression of teaching on each aspect of design and design thinking but this rationale may not be obvious to the student in an online environment where the opportunities to develop an argument are constrained by the media.

Experience on other courses has shown that teaching online requires short, succinct, resources for both text and audio-visual materials. As students become increasingly familiar with online video sites such as YouTube and social networking sites, such as Facebook and Twitter, where communication is often in single sentences their experience of the medium shapes the expectations they bring to courses. Academic authors thus are faced with a tension between the need to express ideas elegantly and clearly and the need to offer sufficient explanation to enable the student to understand the concepts being taught. This demands rethinking the way in which ideas are presented. Some economies of expression can be achieved relatively easily by transferring aspects of teaching to short videos or animations. Instructional and skills based learning are obvious candidates for such treatment but more abstract ideas may also lend themselves to communication in this way, for example, learning about aspects of the design process by talking through a visual mapping of that process.

In the new course students will be offered opportunities to create their own narratives and ways of understanding design issues and processes. The approach adopted is, broadly one of guided discovery, [5] students will be offered a mix of instruction and opportunities for hands-on activity enabling them to learn through doing from an informed base. Three tools will be used to assist with this.

The first tool, Compendium (Fig.1), is an online knowledge mapping tool which enables many different kinds of resources such as videos, photos, pdfs, web-links to be brought together on a student created map, or set of maps. Connections and notes can be made between and, on, the nodes of the map, items can be reconfigured added to and changed. This tool has multiple potentialities, for example it can be used to chart the student's learning and design processes or to gather, classify and link resources around a particular topic. Knowledge mapping can assist the student in their self-constructed learning, allowing the student to map out their learning journey and reflect on how the ideas and knowledge that they have gathered relate to one another, to the tasks in hand and to an understanding of design thinking.

The second tool, Jing, is animated screen capture software that is freely available online. Jing allows the user to add audio or annotated commentary to screen captures in real time and records the outcome as a swf file which can be shared, either via a server or by email. This tool will enable students to present their work from a distance to their peers and tutor assisting the development of important communication skills.

The third tool is a virtual design studio space, OpenDesignStudio (ODS). The concept of a virtual design studio is neither new nor unique to the Open University. The Omnium Creative Waves project at the College of the Fine Arts in New South Wales uses this concept to bring together designers from all over the world to collaborate on projects within a given time frame. [6] [7]. The University of Northumbria's Open Folio project created an online showcase and forum for design students and professionals [8].

Fig 1

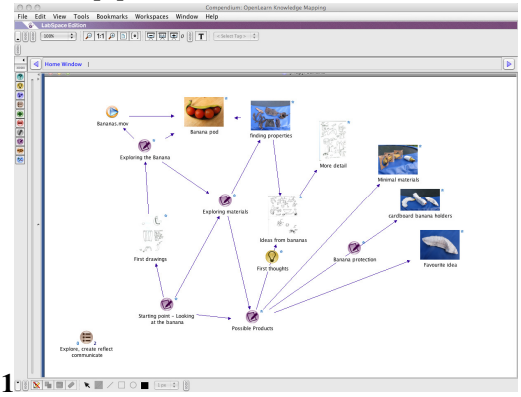

Fig 2

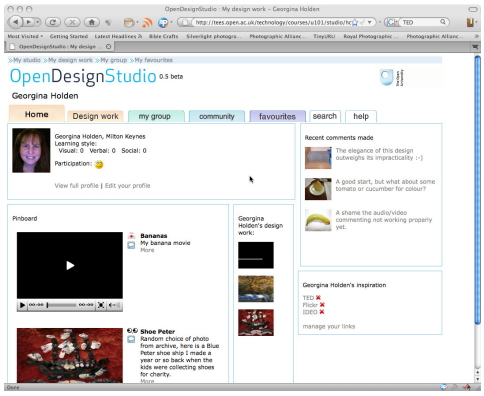

Fig. 1 Compendium map showing a range of different formats integrated into the map.

Fig 2 Prototype of the OpenDesignStudio interface, student home page and pinboard.

The OpenDesignStudio (Fig 2) space develops this idea further through a development of the Flickr photo-sharing interface. ODS will offer a safe, virtual space in which students can post works in progress, leave written, audio or video comments upon one another's work and have dialogues. A less complex version of this studio has been used successfully for the past three years on a short course in Digital Photography and in-house research has shown that students, enjoy the process of peer review and the creation of communities but that to feel confident commenting on and critiquing one another's work, it is important to offer students guidelines for appropriate behaviour and clear criteria for evaluation.[9] Within the ODS students will find a tutor group space which they can use as a base, they will also have access to the work of any member of the course community (possibly 700 students). Activities within the course materials will encourage exploration of this body of work, for example using the tagging facility to find students who have also chosen the same object as their favourite design. Student participation, i.e. commenting on the work of others, will be tracked and rewarded.

The OpenDesignStudio interface adds several features to the existing interface particularly a pin board area on which requests for help, or alternatively, achievements can be digitally displayed. Students will develop an online portfolio and also keep digital images of their sources of inspiration and the results of observations of user behaviour to share with others. The ability to comment both by text and

audio will allow students to reflect and articulate their own practice and to offer advice, encouragement, and constructive criticism of other peoples work and to capture these interactions. To enable students to use this facility the course team have written several "how to" guides, to help students to use cameras, scanners and screen capture software. Though such guidance is less necessary with the 18-25 year old student, many OU Students (average age 37) still require this kind of guidance. Whilst the OpenDesignStudio will not have the tangible immediacy of a live design studio, the advantages are that students will have a record of comments and suggestions and they will easily be able to visit significant numbers of fellow students to talk to about their work. The expectation of the course team is that this articulation of the design process will help to reflect and embed ideas and practice. [10] Potentially too, learners will gain benefit from feedback from the diversity of the student cohort adding a richness of perspective and better cultural understanding.

In addition to the tools discussed above, the well-established forum format will be used for general communication between students. Students have been using forums on OU design courses since the early 2000's. Over this time there has been a significant increase in usage. In 2001 there were 248 messages posted in one forum in a 9 month period, in 2007 this number had increases nine fold and the signs are that this could increase further in 2009. Students are now bringing their experience of general forums and social networking, both positive and negative into the course. Ground rules and discussion of expectations can help the students not only to play a more positive role in the forum but also in a design team. 2009 was the first year in which students used the student fora to exchange facebook details and spontaneously set up a facebook group. Student capacity for self-organisation in these domains is growing rapidly, even amongst the older students of the OU. It is quite possible that the use of SNS sites will, eventually, overtake university run forums. The other technology which could displace the use of forums is voice over internet protocol (VOIP) technologies such Skype and online conference software such as Elluminate or the OU's own FlashMeeting. As use of these technologies diffuses, the potential for use both as a teaching medium and as a collaborative medium expands. This year, these technologies are being used for the first time on the OU design courses for online tutorials and group projects. The integration of these methods into courses is seen as important preparation for employment where the ability to collaborate at a distance with producers and specialists is crucial. Much of this work is being carried out and evaluated as part of a JISC funded project, AtelierD, which is currently underway in the OU Design Group. The AtelierD project aims to look in greater depth at the use of web2 tools for design learning, with particular interest in their use for collaborative design work.

Impact on assessment

In a design education world where peer-to-peer contact is strengthened by the use of online interfaces and tools, serious consideration must be given to the nature of assessment. Design assignments at the OU have in the past been based on the assumption of knowledge acquisition through a common set of resources. In the print era this was, generally, an effective way of ensuring that the majority of students succeeded. Now students are turning to the internet to aid and augment their knowledge, the boundaries are becoming fuzzier and the potential for plagiarism is greater than ever. What is or is not, should or should be regarded as legitimate course content? Is it possible for students to construct their own learning around a given idea? [11] Should educators mediate this learning or create a learning framework in which self-constructed learning is the core strategy?

The experience of other online design educators demonstrates that a formative, project based approach to assessment leads to deep learning [12] [13] Design project work, has always required the student to carry out their own research, and construct their own learning, the discipline is therefore be well placed to extend this approach into acquisition of knowledge which underpins the act of designing.

The use of knowledge maps may, at least in part address the issues of control. If, as educators we can no longer determine all of the sources of learning that our students use then we can ask them to show us what they have found, demonstrate how these resources relate to their learning objectives and reflect on their learning. Knowledge mapping can assist with this giving the student a place in which he or she can collect, organise, analyse and reflect on the materials they have found. [14] [15] The assignments set on the new design thinking course will exploit this opportunity and encourage

exploration so that the student's abilities to make connections and synthesise information, which are fundamental to design thinking, can develop. Assignments will require students to create maps of their learning and design processes and use JING screen capture software to present their work to their tutor. This intimate yet distant communication should, it is expected, not only help the tutor to assess the work but also avoid issues of plagiarism. This method will also aid the development of the student's communication and presentation skills. Tutors will also visit the OpenDesignStudio as part of the assessment process. In the studio tutors will be able to see the progress each student is making and their contributions to the online community, which will better aid them in advising and guiding for future work.

Conclusion

The technologies which are now ubiquitous offer particular opportunities to assist students with their learning and design processes. Peer support is also enabled by technologies that allow groups to form with loose and tenuous connections. At a time when there is increasing pressure on resources and physical studio space in face-to-face settings, these opportunities can and should be embraced by the design education community and used to positively shape future design education.

REFERENCES

[1] Papanek V. cited in Cross N, Roy R, *Designing for the Future*, Course T262, 1976 (Open University)

[2] Cross N. Design Education for Laypeople, *Design Research Society Conference*, 1976 (Working paper)

[3] Cross N. Designerly ways of knowing: Design Discipline versus Design Science, *Design Issues*, Vol. 17, No. 3, Summer, 2001, pp.49-55 (MIT Press)

[4] McLuhan M. *Understanding Media; The Extensions of Man*, original 1964 reprint 1994 (MIT Press, Cambridge, Massachusetts)

[5] Mayer R. Should there be a three strike rule against pure discovery? *American Psychologist* 2004 pp.14-19

[6] Bennett R. & Dziekan V. Online Collaboration in the Creative Process: Working With the Most Interactive Community of Designers We Have [N]ever Met, *Designs on E-Learning Conference Proceedings* 2005, The University of the Arts, London, England.

[7] McIntyre S. McArthur, I. & Watson, K. Preparing Students for the Global Workplace: An Examination of Collaborative Online Learning Approaches, *ConnectEd Conference Proceedings* 2007, UNSW, Sydney, Australia

[8] English S. *Openfolio,* 2001, University of Northumbria

[9] Holden G. Sharing Images Creating Communities, *Making Connections Conference*, 2008, The Open University, Milton Keynes

[10] Schon D. Educating the Reflective Practitioner *Meeting of the American Educational Research Association*, 1987 Washington DC reproduced at http://educ.queensu.ca/~ar/schon87.htm accessed 20/5/09

[11] Kirschner P.A. et al Why minimal guidance during instruction does not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching, *Educational Psychologist* Volume 41:2, 2006 pp.75-86 (Routledge, London)

[12] McIntyre S. (2006) Evaluating Online Assessment Practice in Art and Design *UNSW Compendium of Good Practice in Learning and Teaching*, Issue 5 - UNSW, Sydney, Australia

[13] Biggs J. *Teaching for Quality Learning at University*, 1999, (SRHE & Open University Press, Buckingham).

[14] Selvin A.M. A Brief History of Compendium and Theoretical Perspectives on Compendium, *Compendium Workshop, Semaine de la Connaissance,* June 2006 Nantes, France, http//compendium.open.ac.uk/institute/library/papers.htm [Accessed 24/09/08].

[15] Sierhuis M. Compendium Overview, Presented at *Computational Semantics Laboratory, Stanford University*, September 2006, http://compendium.open.ac.uk/institute/library/papers.htm [Accessed 24/09/08]

Keywords: Distance learning, web2, design education, knowledge mapping, virtual studio, screen

capture, assessment